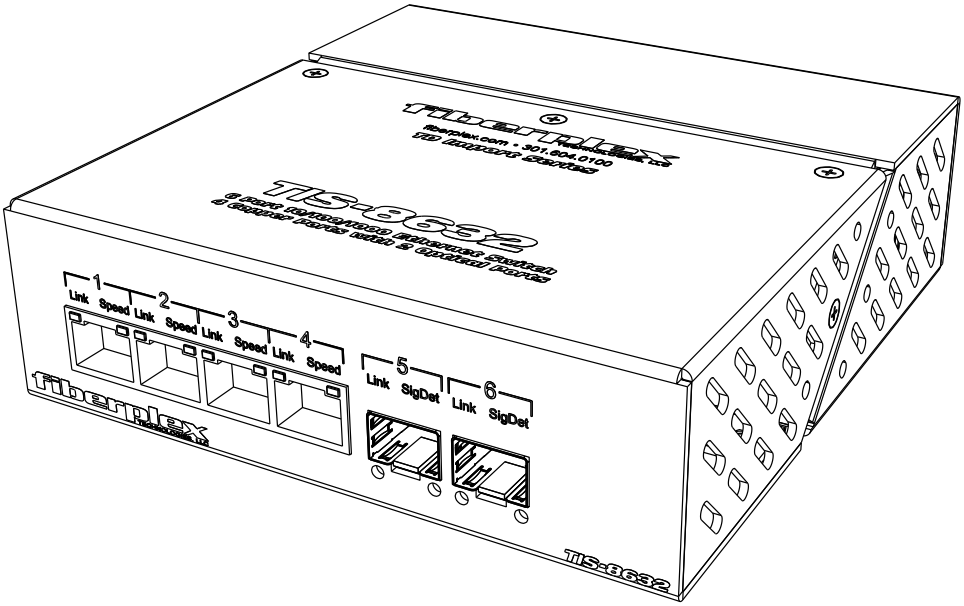

fiberplex TECHNOLOGIES, LLC

USER MANUAL

6 Port 10/100/1000 Ethernet Switch
TIS-8632

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Warning for Your Protection

1. Read these instructions.

2. Keep these instructions.

3. Heed all warnings.

4. Follow all instructions.

5. Do not use this apparatus near water.

6. Clean only with a dry cloth.

7. Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions.

8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

10. Only use attachments/accessories specified by the manufacturer.

11. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

12. Unplug this apparatus during lightning storms or when unused for long periods of time.

13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

The apparatus shall not be exposed to dripping or splashing. No objects filled with liquids, such as vases, shall be placed on the apparatus.

"WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture."

General Installation Instructions

Please consider these general instructions in addition to any product-specific instructions in the "Installation" chapter of this manual.

Unpacking

Check the equipment for any transport damage. If the unit is mechanically damaged, if liquids have been spilled or if objects have fallen into the unit, it must not be connected to the AC power outlet, or it must be immediately disconnected by unplugging the power cable. Repair must only be performed by trained personnel in accordance with the applicable regulations.

Installation Site

Install the unit in a place where the following conditions are met:

- The temperature and the relative humidity of the operating environment must be within the specified limits during operation of the unit. Values specified are applicable to the air inlets of the unit.
- Condensation may not be present during operation. If the unit is installed in a location subject to large variations of ambient temperature (e.g. in an OB-van), appropriate precautions must be taken.
- Unobstructed air flow is essential for proper operation. Ventilation openings of the unit are a functional part of the design and must not be obstructed in any way during operation (e.g. - by objects placed upon them, placement of the unit on a soft surface, or improper installation of the unit within a rack or piece of furniture).
- The unit must not be unduly exposed to external heat sources (direct sunlight, spot lights).

Ambient Temperature

Units and systems by FiberPlex are generally designed for an ambient temperature range (i.e. temperature of the incoming air) of +5...+40 °C. When rack mounting the units, the following facts must be considered:

- The permissible ambient temperature range for operation of the semiconductor components is 0 °C to +70 °C (commercial temperature range for operation).
- The air flow through the installation must allow exhaust air to remain cooler than 70 °C at all times.
- Average temperature increase of the cooling air shall be about 20 C°, allowing for an additional maximum 10 C° increase at the hottest components.

If the cooling function of the installation must be monitored (e.g. for illumination with spot lamps), the exhaust air temperature must be measured directly above the modules at several places within the enclosure.

Grounding and Power Supply

Grounding of units with mains supply (class I equipment) is performed via the protective earth (PE) conductor integrated in three pin Phoenix™ connector. Units with battery operation (< 60 V, class III equipment) must be earthed separately. Grounding the unit is one of the measures for protection against electrical shock hazard (dangerous body currents). Hazardous voltage may not only be caused by defective power supply insulation, but may also be introduced by the connected audio or control cables.

This equipment may require the use of a different line cord, attachment plug, or both, depending on the available power source at installation. If the attachment plug needs to be changed, refer servicing to qualified personnel.

Warranty, Service and Terms and Conditions of Sale

For information about Warranty or Service information, please see our published 'Terms and Conditions of Sale'. This document is available on fiberplex.com or can be obtained by requesting it from clients@fiberplex.com or calling 301.604.0100.

Disposal

Disposal of Packing Materials

The packing materials have been selected with environmental and disposal issues in mind. All packing material can be recycled. Recycling packing saves raw materials and reduces the volume of waste. If you need to dispose of the transport packing materials, recycling is encouraged.

Disposal of Used Equipment

Used equipment contains valuable raw materials as well as substances that must be disposed of professionally. Please dispose of used equipment via an authorized specialist dealer or via the public waste disposal system, ensuring any material that can be recycled has been. Please take care that your used equipment cannot be abused. After having disconnected your used equipment from the mains supply, make sure that the mains connector and the mains cable are made useless.

Disclaimer

The information in this document has been carefully checked and is believed to be accurate at the time of publication. However, no liability is assumed by FiberPlex for inaccuracies, errors, or omissions, nor for loss or damage resulting either directly or indirectly from use of the information contained herein.

Introduction

Elegantly simple yet packed with an advanced feature set, the FiberPlex Technologies TIS-8632 is a powerful 6 Port 10/100/1000 Ethernet Switch. The unit interfaces UTP RJ-45 jacks (x4) to variously populated SFP positions.

Key Features

- 6 Ports – (4) 10/100/1000BASE-T Copper and (2) 1000BASE-X Optical
- Flow control for full duplex and half duplex
- Supports up to 10k byte JUMBO frame
- Supports Ports Based VLANS and TAG Based VLANS
- Conforms to FCC and CE codes
- Includes power adapter as well as a 3-position Phoenix™ connector

The TIS-8632 is housed in the commercial 'Throw Down' packaging. This version is designed to be a work horse unit in various commercial and industrial environments. It is powered either by a 9VDC 'Wall Wart' style supply (included) or via bussed power supplied through an integrated three pin Phoenix™ connector. Up to three TIS-8632 units can be installed in the optional 1U TDR-01 rack shelf.

Standard Ordering Options

TIS-8632-C – Unit with no SFP modules included

TIS-8632-L22 – Unit with (2) 1310 nm Multimode SFP modules (SFP-MC24XC-3131-2) included. Conforms to IEEE 1000BASE-LX standard.

TIS-8632-L5B – Unit with (2) 1310 nm Singlemode SFP Modules (SFP-SC24XC-3131-B) included. Conforms to IEEE 1000BASE-LX10 standard.

Getting Started

Initial Inspection

Immediately upon receipt, inspect the shipping container for damage. The container should be retained until the shipment has been checked for completeness and the equipment has been checked mechanically and electrically. If the shipment is incomplete, if there is mechanical damage, or if the unit fails to operate notify FiberPlex and make the shipping materials available for the carrier's inspection.

Front Indicators/Connections

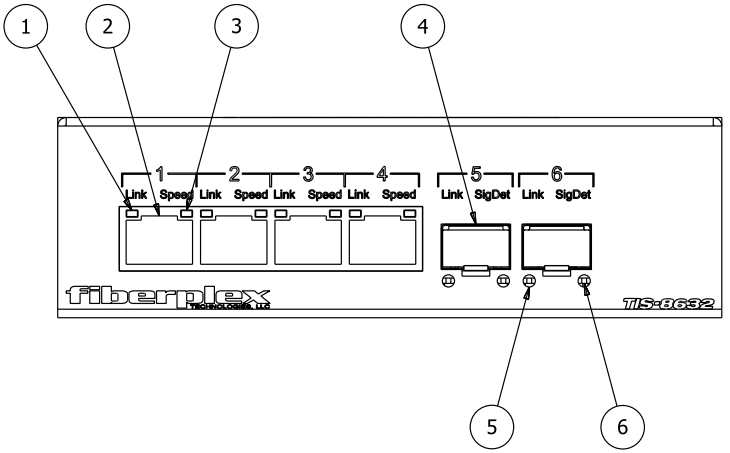


Figure 1 TIS-8632 Front Face

1 **Cable Port LED, Upper Left** – This LED, for each position, indicates status as per the following table;

Cable Port LED (Upper Left)	
Status	**Description**
On	Link is OK
Off	No link present
Blinking	Data is being received or transmitted

2 **Ethernet Cable Port (x4)** – These jacks are Unshielded Twisted Pair RJ-45 cable connection points for Cat5 capability.

3 **Cable Port LED, Upper Right** – This LED, for each position, indicates status as per the following table;

Cable Port LED (Upper Right)	
Status	**Description**
3 Blinks Repeating	1000M Speed
2 Blinks Repeating	100M Speed
1 Blink Repeating	10M Speed

4 **SFP Slot (x2)** – This is a standard MSA-compliant SFP module slot. (See section 'Inserting and Removing SFP Modules') ***These ports operate only at 1000 Base-X rates. Do not connect both SFP ports of one unit to both SFP ports of a second unit, this will cause a switching loop and the units will not operate properly.***

5 **SFP Slot LED, Lower Left**– This LED, for each position, indicates status as per the following table;

SFP Slot LED (Lower Left)	
Status	**Description**
ON	Fiber link is OK
OFF	Fiber link is failed
Blinking	Activity

6 **SFP Slot LED, Lower Right** – This LED, for each position, indicates status as per the following table;

SFP Slot LED (Lower Right)	
Status	**Description**
ON	Optical signal detected
OFF	No laser input

Rear Indicators/Connections

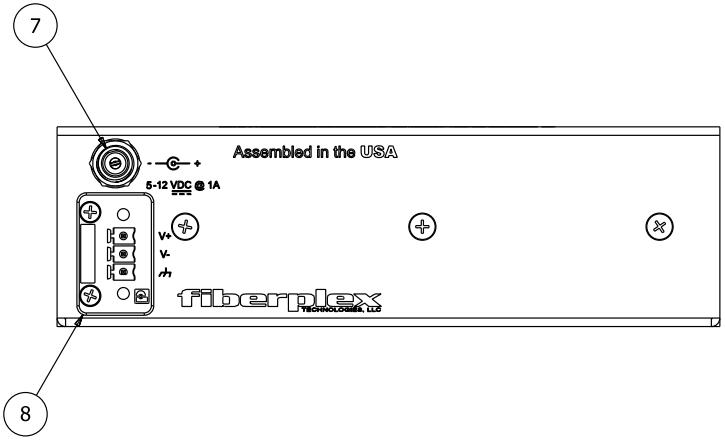


Figure 2 TIS-8632 Rear Face

7 **Circular DC Power Connection** – DC power entry for the unit. This is a standard DC connection for use with the included DC wall power supply.

8 **Phoenix™ Power Connection** – Secondary power option for the TIS-8632. This is wired in direct parallel with the Circular connector and has the addition of a positive earth chassis ground connection. This can be used to power the unit on a client supplied power buss.

Power Requirements and Mounting

Flexible mounting allows the TIS-8632 to be rack shelf mounted or used in a standalone configuration. Up to 3 TIS-8632 units can be mounted on a TDR-01 shelf and powered by a single, integral cable. Alternately, the TIS-8632 can be used in a standalone application when paired with the included DC wall adaptor.

Standalone

For standalone applications, the TIS-8632 comes with (4) peel and stick rubber feet. Simply peel the paper backing from the rubber foot and affix to four corners of the TIS-8632.

Surface Mount

Surface mounting on a wall, desk, or other vertical surface can be accomplished by using either the supplied peel-and-stick Velcro pads, or by using the integrated keyhole mounts with the supplied wood screws.

To use the wood screws:

1. Mark the surface using the supplied template
2. Screw the #2 ½" wood screws into the surface at each mark
3. Leave a small amount of thread to accommodate the thickness of the TIS-8632 case
4. Put the large part of the keyhole over the screw head and pull to engage

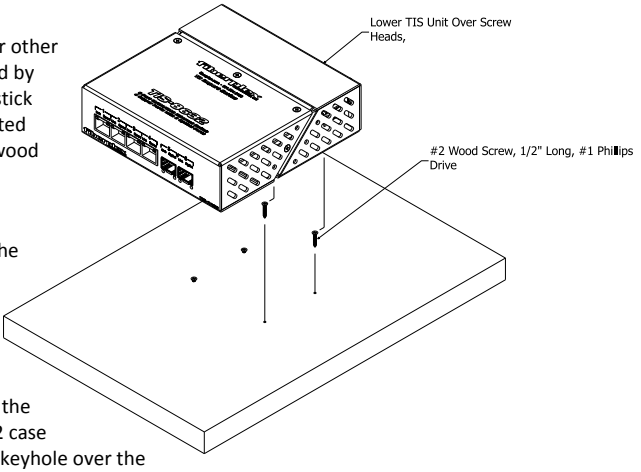


Figure 3 TIS-8632 Surface Mount

DIN Rail

Using the TD-DINR, the TIS-8632 can be mounted to a DIN rail. See the TD-DINR user manual for more details on configuration options. Mount the TIS-8632 the TD-DINR in the same manner regardless of the initial configuration of the mount itself or the height of top hat DIN rail utilized (35 x 7.5 or 35 x 15mm). The edge mounting solution happens to be shown below. All fasteners necessary for configuration and mounting are included with the TD-DINR.

1. Line up key hole on the bottom of the TIS-8632 with the studs on the Mounting Bracket and push flat against the plate.
2. Slide the TIS-8632 forward until it stops.
3. Tighten the Retaining Screw until snug.
4. Snap the Rail Clips on to the DIN Rail.

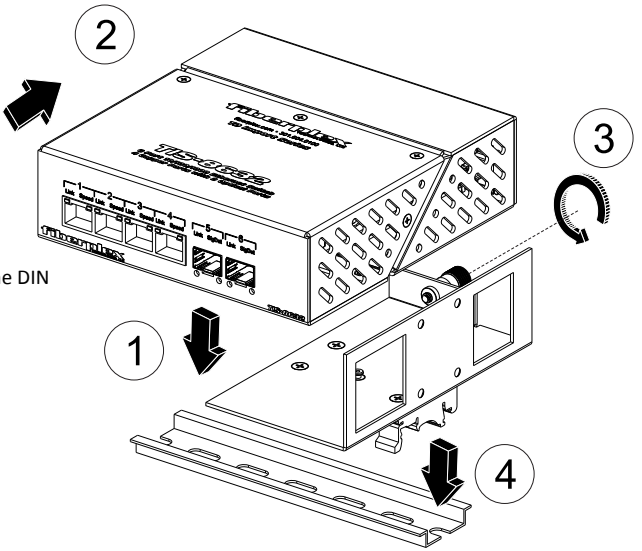


Figure 4 TIS-8632 installation on a TD-DINR

Tray Mounting

Complementing the flexibility of the FiberPlex 'TD Series' of fiber optic modules, the TDR-01-AC provides mounting, power and cable management for up to 6 modules in a compact and rugged aluminum 1U rack. The integrated key-hole mounting holes on the bottom the TD units lock securely on mating studs while a rear retention bar holds them securely in place. A 6 position wiring harness and included power adapter provide, not just 9 VDC power, but a positive earth ground to the modules via 3 position Phoenix™ locking power connectors. Managing all that cabling and fiber can sometimes be quite a chore so an extended cabling tray with integrated tie down points are provided to help make your installation clean.

*****NOTE: The TDR and TDP trays use a 9VDC 3.5 Amp power adapter. When 3 TIS-8632 are used in the same rack certain SFP populations could exceed a 3.5 Amp requirement. Please carefully check your configuration against the specification table to verify your current draw.***

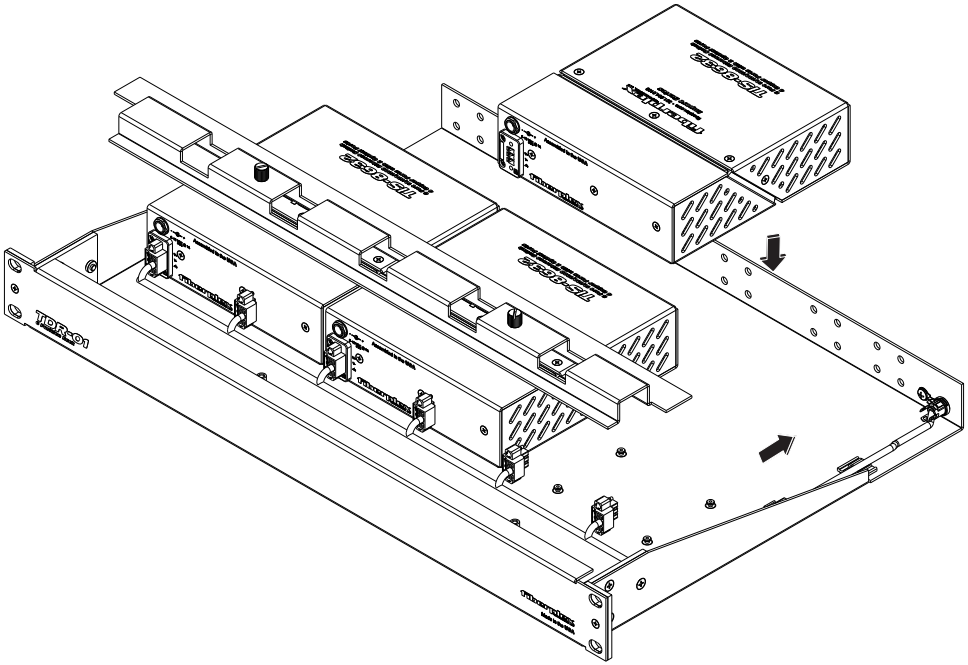


Figure 5 TIS-8632 installation on a TDR-01-AC tray

Inserting and Removing SFP Modules

Handling Warnings

SFP Modules are static sensitive. To prevent damage from electrostatic discharge (ESD), it is recommended to attach an ESD preventative wrist strap to your wrist and to a bare metal surface when you install or remove an SFP Module.

Disconnect all optical or copper cables from SFP Modules prior to installing or removing the SFP Module. Failure to do so could result in damage to the cable, cable connector or the SFP Module itself. Removing and inserting an SFP Module can shorten its useful life, so you should not remove and insert SFP Modules any more often than is absolutely necessary.

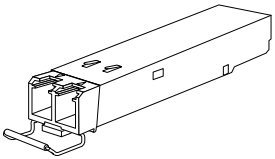
Protect optical SFP modules by inserting clean dust covers into them after the cables are removed. Be sure to clean the optic surfaces of the fiber cables before you plug them back into the optical ports of another SFP module. Avoid getting dust and other contaminants into the optical ports of your SFP modules, because the optics will not work correctly when obstructed with dust.

Identify the Latch Type of the SFP Module

SFP Modules have various latching mechanisms to secure them into the SFP Cage of a device. FiberPlex Modules can support a host of manufacturers and brands of SFP Modules so the user may encounter any number of different latches. Some of these are described below.

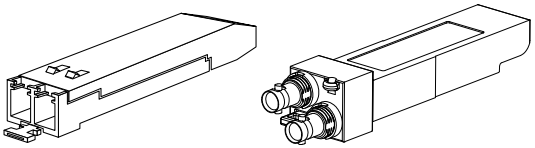
Bail Clasp

The bail clasp SFP module has a clasp that you use to remove or install the SFP module.



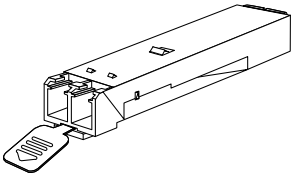
Actuator Button

The actuator button SFP module includes a button that you push in order to remove the SFP module from a port. This button can either lift 'Up' or press 'In' to release the SFP Module depending on the manufacturer.



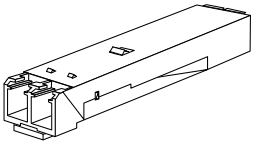
Mylar Tab

The Mylar tab SFP module has a tab that you pull to remove the module from a port.

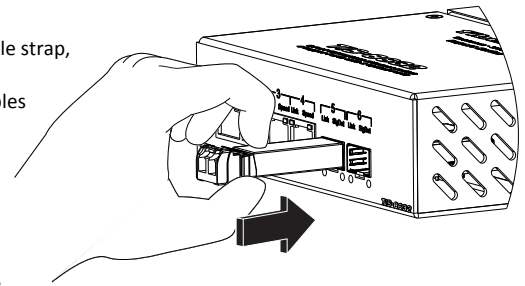


Slide Tab

The slide tab SFP module has a tab underneath the front of the SFP module that you use to disengage the module from a port.

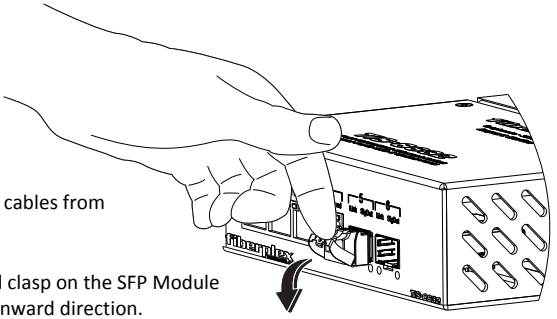


Inserting a Module

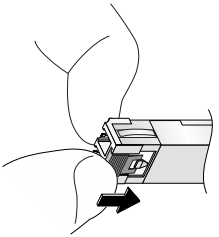


1) Attach an ESD-preventative wrist or ankle strap, following its instructions for use.
2) Disconnect and remove all interface cables from SFP Module.
3) If the SFP Module has a Bail Clasp, close the Bail Clasp before inserting the SFP Module.
4) With the gold finger connector on the bottom and the label on the top, line up the SFP Module with the empty cage and slide it in making sure that it is completely inserted and seated in the cage.

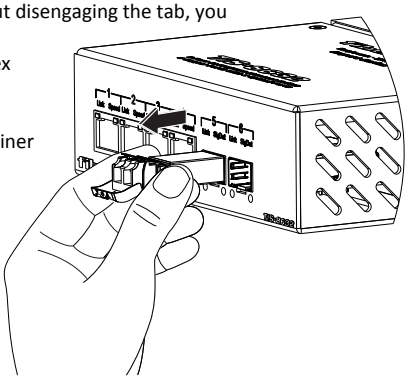
Removing a Module



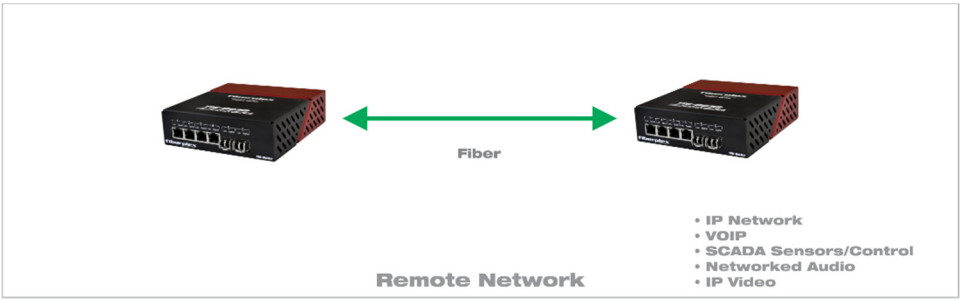
1) Attach an ESD-preventative wrist or ankle strap, following its instructions for use.
2) Disconnect and remove all interface cables from SFP Module.
3) Release the latching mechanism.
    - Bail Clasp – Open the bail clasp on the SFP Module with your finger in a downward direction.
    - Actuator Button – Gently press the actuator up (or in) while pulling the body of the SFP Module to release the SFP Module from the cage.
    - Mylar Tab – Pull the tab gently in a straight outward motion until it disengages from the port. Make sure the tab is not twisted when pulling as it may become disconnected from the SFP Module.
    - Slide Tab - With your thumb, push the slide tab on the bottom front of the SFP module in the direction of the equipment to disengage the module from the line card port. If you pull on the SFP module without disengaging the tab, you can damage the SFP module.

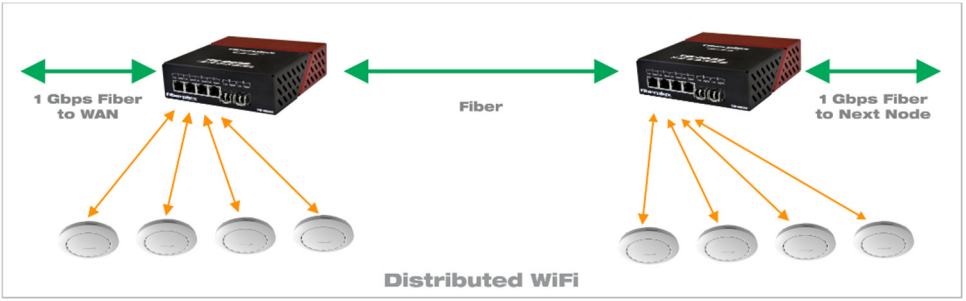


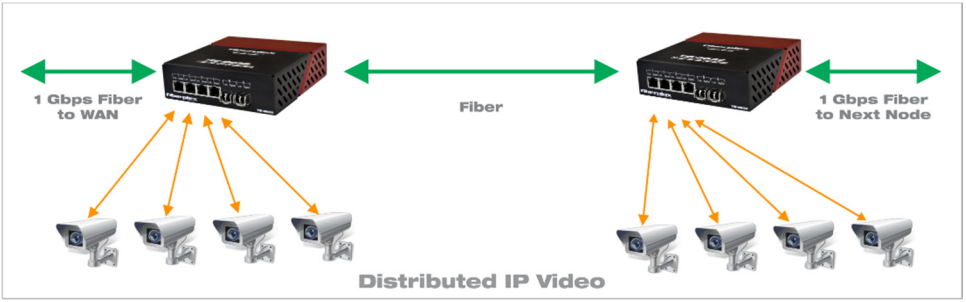
4) Grasp the SFP Module between your thumb and index finger and carefully remove it from the port
5) Place the SFP Module on an antistatic mat, or immediately place it in a static shielding bag or container

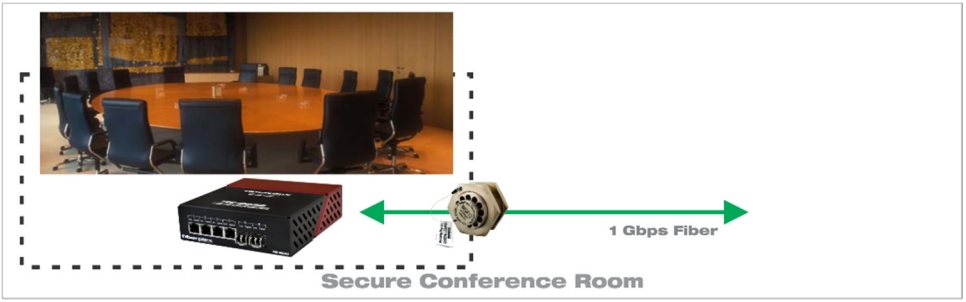


Applications









Additional Information

Bonding Units

Two TIS-8632 can be bonded together locally to make the equivalent of an 8 Copper x 2 fiber switch by using an SFP Passive Cable Assembly like the FiberPlex FC-QDAXX1-0-0.5M. These passive cables are terminated with SFP compatible connectors and are considerably cheaper than using a pair of optical modules with a fiber jumper. The cables are only useful for short connections.

In this configuration, one SFP port on each TIS-8632 is occupied by the Passive Cable Assembly leaving one SFP port on each TIS-8632 that can still be utilized for optical modules. This also results in 8 local 10/100/1000 copper ports.

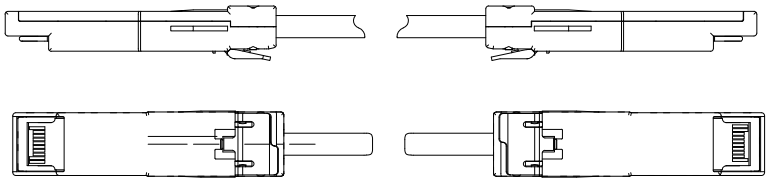


Figure 6 Representative Drawing of an SFP Passive Cable Assembly

SFP MSA Compliance

The SFP Multisource Agreement (MSA) is an agreement that was drafted among competing manufacturers of SFP optical modules. The SFF Committee was formed to oversee the creation and maintenance of these agreements including the SFP MSA designated as INF-8074i. This agreement describes a mutually agreed upon standard for the form and function of SFP modules. However, not all SFPs produced are MSA compliant. The MSA provides for a transceiver (TX/RX) pinout. Other industries such as broadcast had the need for dual TX and dual RX SFP for uni-directional applications such as video. Naturally, a non-MSA standard was introduced allocating pinout assignments for dual output and dual input I/O configurations. In addition, the some of the internal serial communication pins were reassigned.

The TIS-8632 will only accept MSA compliant SFP modules which support a 1.25 Gbps data rate.

Pinout Comparison Chart

PIN	Transceiver (MSA)	Transceiver (Non-MSA)	Dual TX (Non-MSA)	Dual RX (Non-MSA)
1	VEE	VEE	VEE	VEE
2	TX_FAULT [VEE]	VEE	NC	Rx2-
3	TX_DIS	NC	NC	Rx2+
4	MOD_DEF(2) - SDA	VEE	VEE	VEE
5	MOD_DEF(1) - SCL	SCL	SCL	SCL
6	MOD_DEF(0) – PRESENCE [VEE]	SDA	SDA	SDA
7	Rate [NC]	VEE	VEE	VEE
8	LOS	RX1_LOS	Tx2+	NC
9	VEE	NC	Tx2-	NC
10	VEE	NC	Tx2_DIS	NC
11	VEE	VEE	VEE	VEE
12	RD-	Rx1-	NC	Rx1-
13	RD+	Rx1+	NC	Rx1+
14	VEE	VEE	VEE	VEE
15	VCC	VCC	VCC	VCC
16	VCC	VCC	VCC	VCC
17	VEE	VEE	VEE	VEE
18	TD+	Tx1+	Tx1+	NC
19	TD-	Tx1-	Tx1-	NC
20	VEE	Tx1_DIS	Tx1_DIS	NC

Specifications

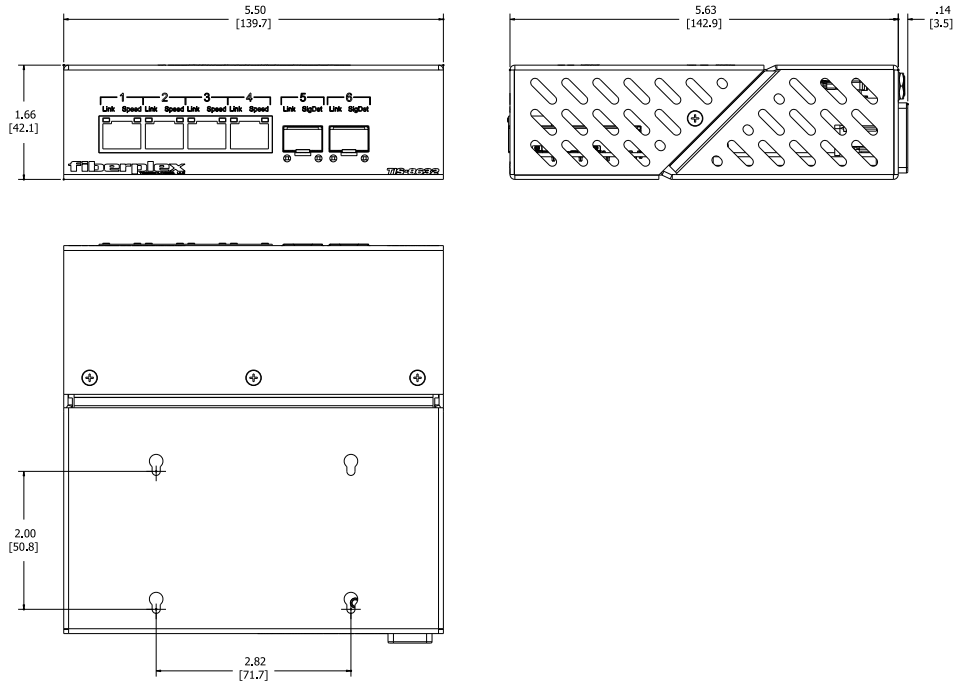


Figure 7 TIS-8632 Dimensions

SUPPORTED STANDARDS

Copper UTP RJ-45 Interface						
IEEE Standard	**Cable**				**Data Rate**	**IEEE Max Distance**
10BASE-T	CAT-3 or better				10 Mbps	100 m
100BASE-T	CAT-5 or better				100 Mbps	100 m
1000BASE-T	CAT-5e or better				1000 Mbps	100 m
Optical SFP Interface						
IEEE Standard	**FiberPlex SFP**	**Fiber Type**	**λ (nm)**	**Avg Transmitter Power (dBm)**	**Receiver Sensitivity (dBm)**	**IEEE Max Distance**
1000BASE-CX	FC-QDAXX1-0-1M	Copper	n/a	n/a	n/a	25 m
1000BASE-SX	SFP-MC24XC-8585-0	Multimode	850	-6	-18	500 m
1000BASE-LX	**SFP-MC24XC-3131-2**	**Multimode**	**1310**	**-11**	**-24**	**500 m**
1000BASE-LX	SFP-MC24XC-3131-2	Singlemode	1310	-11	-24	2 km
1000BASE-LX10	**SFP-SC24XC-3131-B**	**Singlemode**	**1310**	**-6**	**-25**	**20 km**
1000BASE‑EX	SFP-SC24XC-3131-C	Singlemode	1310	-2.5	-25	40 km
1000BASE‑ZX	SFP-SC24XC-5555-F	Singlemode	1550	+2.5	-25	70 km
1000BASE‑BX10	SFP-SC24BD-4931-B	Singlemode	1490/1310	-6	-25	20 km
1000BASE-T	SFP-RTGTXC-0000-0	Copper	n/a	n/a	n/a	100 m

ELECTRICAL SPECIFICATIONS

		Min	Typ	Max	unit
Environmental	Storage Temperature (°C)	-40	-	85	°C
	Operating Temperature (°C)	0	-	50	°C
Power Requirement	Voltage Range	-	9	-	VDC
	Supply Current with SFP ports empty	100	-	525	mA
	Supply Current with 2 optical SFPs	475	-	900	mA
	Supply Current with 1 optical and 1 RJ45 SFP	385	-	1150	mA
	Supply Current with 2 RJ45 SFP	240	-	1340	mA
Phoenix™ Mating Plug 3 Position Power (P/N 1827716)	Wire Accepted	14	-	28	AWG
	Nominal Voltage	-	-	300	V
	Nominal Current	-	-	8	A
Power Adapter Connection	Standard 5.5 x 2.1 mm DC barrel, center positive				

OPTICAL SPECIFICATIONS

External SFP Interface	Min	Typ	Max	Unit
Data Rate	-	1.25	-	Gbps
Recommended Jitter	-	40	-	Psec
Operating Voltage	-	3.3		VDC
Maximum Current	-	-	500	mA
Optical Modules	SFP MSA (SFF-8431, SFF-8432, SFF-8433) compliant slot, data rate 1.25 Gbps OC24			

PHYSICAL SPECIFICATIONS

Case Dimensions	Length	Width	Height	Weight
TIS-8632	5.63 in (143 mm)	5.50 in (140 mm)	1.66 in (42 mm)	0.6 lb (0.3 kg)

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